Wood Energy Program
Progress Report

Grantee: City of Craig
Project Name: Craig Biomass District Heating
Grant #: 2195233
Period of Report: April 1-June 30, 2008

**Project Activities Completed:**
The project's mechanical systems, including installation of the wood boiler components and control components installed by the mechanical contractor nearly complete, the boiler system underwent start up in April. Representatives from Chiptec arrived to begin start up routines. A subcontractor to the mechanical contractor arrived a few days later to fine-tune the mechanical system controls for the facility. The wood delivery and other mechanical systems were tested.

The Chiptec team stayed on site for approximately one week over oversaw the initial fire up of the boiler and gasifier. The Chiptec representatives and city crew agreed to complete the initial fire-up using cedar wood chips from a local sawmill. Wood chips were delivered. Staff took an initial moisture content reading of the wood chips and then engaged the wood drying system.

After an initial smoky start up period, the system appeared to burn well. The water in the system was brought up to approximately 150 degrees and was successfully circulated into the recipient buildings. City and school district staff trained on the fire start-up routines and tested the electronic controls of the mechanical systems installed by both Chiptec and the mechanical contractor.

Project photos are attached.

**Existing or Potential Problems:**
As expected, there were some trial and error involved in setting the rate of operation of the multiple variable frequency drives in the boiler building. In addition, there was some difficulty in precisely controlling a number of valves in the mechanical system using the control computer. After testing a number of settings, however, staff was able to establish set points for most of the valves and variable speed drives that control the distribution of hot water from the boiler to the recipient buildings.

Staff also discovered that the wood fuel reaching the delivery system and the boiler was much drier than expected, as low as five percent moisture content. Staff will adjust the settings on the air handling units over time to achieve a less dry condition. Chiptec representatives stated that wood fuel that is to dry does not feed as well into the gasifier, as a higher moisture content, approximately 20 percent or higher, provides some lubrication benefits as it travels through the auger feed systems from the wood storage bin into the gasifier.

Another start up issue was that relatively warm ambient outside temperatures reduced the demand for heat from the recipient buildings. School district staff had to turn the thermostat at the middle school building up very high to create enough demand on the boiler to meet some target points needed by Chiptec staff during the start up routine. In the end, the demand level placed on the boiler during the start up routine was only about 25 percent of the capacity of the system. Full testing at close to 100 percent capacity will have to wait for winter weather in Craig.

City and school district staffs plan to begin phasing hog fuel into the boiler building to replace chips as the primary fuel source. The boiler system is currently shut down and will restart after the start of the school year and the coming of cooler weather. There remains a small punch list of items for the mechanical contractor to complete, including balancing the air handling system in the boiler building.

**Activities Targeted for Next Reporting Period:**
Completion of project punchlist.


Chiptec control panel


Chiptec control panel display


View of computer control area and incline auger


View of metering auger with gasifier behind

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|   |   |
| Variable speed drive pumps | View of boiler w/ gasifier at photo right |
| | |
|   |   |
| Hydraulic ram assembly at wood bin floor | Wood bin with spruce/hemlock chips |